

WE CLAIM

1. A micro-electromechanical device that comprises
a substrate that incorporates drive circuitry;
an elongate drive member, the drive member being fast with the substrate at a fixed
end and incorporating an electrical circuit that is in electrical contact with the drive
circuitry to receive an electrical signal from the drive circuitry, the drive member being
configured so that a free end is displaced relative to the substrate on receipt of the electrical
signal;

10 a motion-transmitting member that is fast with the free end of the drive member so
that the motion-transmitting member is displaced together with the free end; and
a working member that is fast with the motion-transmitting member to be displaced
together with the motion-transmitting member to perform work.

2. A micro-electromechanical device as claimed in claim 1, in which the motion-
transmitting member defines a first class lever and has an effort formation that is fast with
the free end of the drive member, a load formation that is fast with the working member
and a fulcrum formation that is fast with the substrate, the effort and load formations being
pivotal with respect to the fulcrum formation.

20

3. A micro-electromechanical device as claimed in claim 1, in which the drive member
is a thermal bend actuator of the type that uses differential thermal expansion to achieve
displacement.

4. A micro-electromechanical device as claimed in claim 3, in which the thermal bend
actuator is of a conductive material that is capable of thermal expansion and has an active
portion and a passive portion, the active portion defining the electrical circuit, in the form
of a heating circuit, so that the active portion is heated and expands relative to the passive
portion on receipt of the electrical signal to generate displacement of the actuator in one
30 direction and termination of the signal results in contraction of the active portion to
generate displacement of the actuator in an opposite direction.

5. A micro-electromechanical device as claimed in claim 4, in which the conductive material of the actuator is resiliently flexible to facilitate said displacement of the actuator in the opposite direction.

6. A micro-electromechanical device as claimed in claim 1, in which the drive member and the working member are of the same material, while the motion-transmitting member is of a different material to that of the drive member and the working member.

7. A micro-electromechanical device as claimed in claim 6, in which the drive member
10 and the working member are both of titanium nitride.

8. A micro-electromechanical device that comprises
a substrate that incorporates drive circuitry;
a plurality of elongate drive members, each drive member being fast with the
substrate at a fixed end and incorporating an electrical circuit that is in electrical contact
with the drive circuitry to receive an electrical signal from the drive circuitry, the drive
member being configured so that a free end is displaced relative to the substrate on receipt
of the electrical signal;

a plurality of motion-transmitting members fast with respective free ends of the
20 drive members so that each motion-transmitting member is displaced together with its
associated free end; and

a plurality of working members fast with respective motion-transmitting members
so that each working member is displaced together with its associated motion-transmitting
member to perform work.